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AUTHOR McPartland, James M.; Epstein, Joyce L.
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ABSTRACT

Results are reported from a survey of 6,185 students in 23 elementary schools, 10 middle schools, and 6 high schools of a Maryland suburban district where schools vary significantly in the authority systems of the classrooms at each grade level. Analyses of the relationship between the 'openness' of a school's instructional program and student achievement failed to show a consistent pattern across four elementary and secondary grades. Family background variables were then statistically controlled for. In no case was more than 3 percent of the total variation uniquely accounted for by school openness. However, in every case there was a large interaction effect between school openness and student family background on achievement. The pattern was always the same: students from the higher social class categories showed a more positive relationship between school openness and achievement than students from the lower social classes. In grades where the overall relationship was positive, the more advantaged students were most strongly positive; where the overall relationships were negative, the higher social class group was least negative; where the overall relationship was not significant, the higher social class group tended toward a positive relationship, while the lower social class group tended toward a negative one. (Author/JM)

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SOCIAL CLASS DIFFERENCES IN THE EFFECTS OF OPEN SCHOOLS ON STUDENT ACHIEVEMENT

James M. McPartland and Joyce L. Epstein

The Johns Hopkins University

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James M. McPartland

Joyce L. Epstein

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The Johns Hopkins University

Baltimore, Maryland

Introductory Statement

The Center for Social Organization of Schools has two primary objectives: to develop a scientific knowledge of how schools affect their students, and to use this knowledge to develop better school practices and organization.

The Center works through three programs to achieve its objectives. The Schools and Maturity program is studying the effects of school, family, and peer group experiences on the development of attitudes consistent with psychosocial maturity. The objectives are to formulate, assess, and research important educational goals other than traditional academic achievement. The School Organization program is currently concerned with authority-control structures, task structures, reward systems, and peer group processes in schools. The Careers program (formerly Careers and Curricula) bases its work upon a theory of career development. It has developed a self-administered vocational guidance device and a self-directed career program to promote vocational development and to foster satisfying curricular decisions for high school, college, and adult populations.

This report, prepared by the School Organization Program, investigates how social class and open school interactions affect student achievement.

ABSTRACT

Results are reported from a survey of 6185 students in 23 elementary schools, 10 middle schools and 6 high schools of a Maryland suburban district where schools vary significantly in the authority systems of the classrooms at each grade level.

Analyses of the relationship between the "openness" of a school's instructional program and student achievement failed to show a consistent pattern across four elementary and secondary grades. After statistically controlling for family background variables, the relationship was significantly positive in some grades, significantly negative in another, and insignificant in another; although in no case was more than two percent of the total variation uniquely accounted for by school openness. Other tests of the direct effect of school openness on achievement also indicated that there is little reason to believe that academic outcomes are seriously influenced by this variation in school organization. When the number of years in attendance in open schools was used as a variable, there was no trend of achievement differences with a student's duration of exposure to school openness. Also, when distinctions were made between academic subjects within each school on the openness of the instructional approach, the relationships with achievement test scores in specific subjects did not suggest an effect of openness: the degree of openness of English instruction was no more related to English test scores than to Math test scores, and similarly for the degree of openness of Math instruction.

Statistical tests failed to uncover consistent interaction effects on achievement between school openness and features of the students' family background. Neither a student's home socio-economic status nor family authority structure appeared to influence the size or direction of open school effects on achievement, although both family factors are important independent correlates of achievement. Although students from higher social class categories showed a slightly more positive relationship in each grade between school openness and achievement than students from lower social classes, these differences were not statistically significant. The results are discussed in terms of previous research on differential sensitivity of students to school differences.

Introduction

The recent development of "open" instructional programs in some public schools provides an important research opportunity for educational sociologists. Before this, the most noteworthy widespread natural variations between schools involved the social rather than the organizational context of instruction.[1] Because of existing contrasts in social contexts, important research has been completed on the impacts of the peer groups or of teacher-student relationships on student development. At the same time, however, we know very little about the importance of alternative authority structures, or of differing formal task and reward systems for student learning, because there have been few significant comparisons outside of laboratory settings to study.

The advent of "open" schools should change this situation. Recent studies have indicated that typical "open" instructional programs differ from the more "traditional" approaches in the organizational structure of the learning environment, including changes in the authority-control systems (Walberg and Thomas, 1969). Some research has shown that, compared to the more traditional mode of operation, the open school provides more alternative activities to meet student interests or needs, and the students are given a greater share of the authority for selecting assignments, supervising progress and setting goals (McPartland and Epstein, 1973).

Thus, open schools which enroll a representative cross-section of students provide important natural environments for researchers to empirically examine how various dimensions of student development are related to the authority system of the learning environment, and how such relationships

may be conditioned by student differences in earlier experiences at home or in previous grades. This study uses a sample of "open" and "traditional" programs in the same school system to examine relationships with one important student outcome: cognitive learning as measured by standardized achievement tests.

The Sample and Measurement of Variables

A county school system in suburban Maryland known for developing "open" instructional programs at both the elementary and secondary levels was chosen for this study. This system has twenty-three elementary schools (grades K-5), ten middle schools (grades 6-8) and six high schools (grades 9-12). A survey questionnaire was administered in Spring, 1973 and one year later in Spring, 1974 to all students in five selected grades. Standardized achievement tests were administered by the school system in four of the five grades during the period of the most recent survey. The 6225 students in these four grades comprise the sample for this study of achievement differences:

1896 students in grade 5 of 23 elementary schools;
1773 students in grade 7 of 10 middle schools;
1629 students in grade 9 of 6 high schools;
927 students in grade 12 of 5 high schools.[2]

The measures

(1) School openness is a measure based on the average student response to a 28-item index. Each of seven questions on the student questionnaire was repeated four times, to refer separately to each of four academic subjects. The first of these seven questions appeared in the following form:[3]

Read each sentence below. Then, for each of the subjects, check the line that tells how often the statement is true for you in each subject.

1. In class, I must sit next to the same students.

	Always	Often	Sometimes	Seldom	Never
English	_____	_____	_____	_____	_____
Math	_____	_____	_____	_____	_____
Social Studies	_____	_____	_____	_____	_____
Science	_____	_____	_____	_____	_____

The remaining six questions, which also followed the same subject-specific format, were:

2. I can talk to other students while I work.

3. In class, I can move about the room without asking the teacher.

4. In class, the teacher stands in front of the room and works with the class as a whole.

5. When I am working on a lesson, the other students in my class are working on the same lesson.

6. Most days there are several assignments the teacher tells me I could select, and I choose the one I want to work on.

7. I could fall behind in my work without the teacher finding out about it for a couple of weeks or more.

For each of the 28 items (7 questions X 4 subjects) the percent of students who saw the program as "open"[4] was calculated in each grade in each school. The measure of "school openness" is the average percent across the 28 items for the particular grade and school. The average is assigned to each individual student that corresponds to the school and grade in which he is enrolled. For example, a score of 25.0 for a particular school means that on the average item 25 percent of the students report that the school is usually open in its mode of operation. Theoretically, the score could range from 0 to 100.0 for each school. The actual range of scores in this

sample on the school openness measure is 11.5 to 39.7 in grade 5, 10.2 to 35.3 in grade 6, 14.4 to 37.3 in grade 7, 16.5 to 53.1 in grade 9, and 17.4 to 58.1 in grade 12.

A two-way analysis of variance (school-by-subject) of the student averages in each grade for each of the seven questions showed a statistically significant effect of schools for every grade and every question (beyond the .001 level), although the differences between subjects was not a significant source of variation. This analysis indicated that the present sample of schools provides the necessary contrasts on the organizational dimensions to examine relationships with student outcomes.

A principal component factor analysis was conducted to examine the structure which underlies the several questions used in the openness index. A clear structure of three main factors emerged: (a) variety of activities permitted, (b) degree of individualization of tasks, and (c) amount of student share of authority for task assignment and supervision.[5] In the results to be reported here, an overall openness index that combines all factors is used.

(2) There are seven variables used to measure differences in student inputs to the schools. These variables include parents' education, material possessions in the home, family size, family decision-making style, rules for children in the home, sex and race. The first three are indicators of socio-economic status, and the next two are measures of the authority structure in the home.

(a) Parents' education is the sum of the score on two student questionnaire items: "How far in school did your father go?" and "How far in school did your mother go?"[6]

(b) Material possessions in the home is the number of items checked by students from a check-list of 23 possibilities.[7]

(c) Family size is measured by one student questionnaire item: "How many brothers and sisters do you have?"

(d) Family decision-making style is a scale composed of the sum of scores from twelve items on the student questionnaire.[8]

(e) Rules for children in the home is the number of behaviors from a check-list of 14 possibilities for which a student indicates on the questionnaire that his parents have definite rules.[9]

(f) Sex is scored Male = 1, Female = 0.

(g) Race is scored White = 1, Black = 0, Other = blank.

(3) The student outcome variables of cognitive learning are measured by individual student scores on the Iowa Tests of Basic Skills. Results are reported on selected subtests of the Iowa Tests (Language Total, Mathematics Total, Work and Study Skills Total, and Reading Comprehension) as well as on the composite score which combines all subtests.

Results of Analyses of Relationships

Multiple regression analyses were conducted to examine the overall relationship between school openness and student achievement, as well as to investigate whether certain student background characteristics interact with school openness to influence achievement.

Overall school effects

Table 1 presents the unique contribution of school openness to accounted for variance in several achievement test areas for four grades. The unique

contribution of school openness is equal to the gain in the squared multiple correlation coefficient from adding the school openness measure to a regression which had included the seven student input measures as independent variables. A sign is shown in the Table for each value to indicate the direction of the relationship between school openness and achievement. (This sign is taken from the partial regression coefficient in the total equation).

School openness accounts for a very small proportion of the variance in achievement: less than 1 percent in 15 of the 16 cases, and always less than 2 percent. Nevertheless, in some grades the values are significantly different from zero, although the direction of the relationship is inconsistent across grades and tests. In grade 5, school openness has a significant positive relationship to performance on four of the five tests. In grade 7, no values are statistically different from zero except for the Mathematics test, which is negative. Grade 9 shows a significant negative relationship between openness and test performance, while grade 12 shows a positive value for the one subtest available.

The inconsistency of the size and direction of relationships across the tests and grades can either be interpreted to mean there is no true effect of school openness on test performance, or that "open" programs are capable of either improving or detracting from test performance depending on some unknown features of program implementation.

In any case the unique contribution by school openness to explained variation in achievement is very small compared to other measured and unmeasured factors. Table 2 presents the partitioning of explained variation[10] among three sets of variables used in the analyses: student background measured by 5 variables (sex, race, parents' education, material possessions,

family size); family authority status measured by two variables (family decision-making style and rules), and school openness. The contribution of the school openness variable both uniquely and jointly is only a small fraction of the contribution of the student background variables in accounting for student test performance.

Other tests of the direct effect of school openness on achievement also indicate that there is little reason to believe that academic performance is seriously influenced by this variation in school organization. When the number of years in attendance in open schools was used as a variable, there was no trend of achievement differences with a student's duration of exposure to school openness. In these analyses, the same Background and Family variables as above are statistically taken into account, and the average residualized achievement score is calculated for student groups having (a) zero years in open schools, (b) one year in open schools and (c) two or more years in open schools. The values for girls and boys respectively are: 1.2, 4.1, -2.3 and 1.8, -2.8, -0.3 in grade nine; 0.4, 7.1, -1.2 and 0.8, -0.8, 0.8 in grade seven; and -0.3, 3.7, 5.5 and 0.3, 7.9, 3.4 in grade five. With one exception, no trend is evident in these averages for either girls or boys in the various grades, and the differences are not statistically significant. The single exception is the positive trend for fifth grade girls.

As the basis for a further test of the existence of true open school effects on student achievement, separate measures were constructed on the openness of the instructional approach used for each subject within each school. A separate openness index was calculated for English,

Mathematics and Social Studies in each school using the same seven items presented above to measure openness. There are also available separate achievement tests in the three subject areas. If openness actually has a direct effect on student achievement, it would be expected that the relationship would be highest for openness in a given subject with a matching test than with a nonmatching test. That is, differences in English openness should be more highly related to variations in language performance than in Mathematics performance or Social Studies skills. Similarly, differences in openness of Mathematics instruction should be more highly associated with Mathematics test scores than with the other two tests. And the same matching pattern should hold between openness of Social Studies instruction and the Social Studies test (which is called Work-Study Skills by the test publisher).

To properly use these expectations as a test of the direct effects of openness on achievement, there must be actual differences in the instructional approaches used for each subject within schools. An examination of the intercorrelation matrix for the three openness context measures shows this to be achieved in grades 5 (where the intercorrelations are all .5 or less) grade 7 (where they are .3 or less), but only in a limited way in grade 9 (where English and Math are almost completely related in openness within school and Social Studies is correlated .6 with the other two).

Table 3 summarizes the results of this further test of the direct relationship of openness and test performance. These results do not suggest a true effect of openness on academic achievement. Generally, the degree

of openness of a specific subject is as likely to be associated with test performance in a different subject as it is with achievement in the same subject. The only possible exception is again in the fifth grade, where Openness of English instruction is more associated with Language Test performance than with other test score variations. But in this case, the relationships are all very small, and the pattern does not carry over to Openness in the other subjects.

Interaction of family and school

An important question for both educational researchers and practioners is whether personal characteristics of students influence the effects of differences in the authority system of the school environment on individual student learning. There are no consistent research findings that interactions between student and school characteristics influence learning outcomes. An understanding of the sources of differential student sensitivity to particular environmental differences in the learning process depends upon such research (Berliner and Cahen, 1973).

In this study, tests were made for the possible existence of interactions between openness of school and students' home environment. Three interaction variables were created for regression analyses by calculating the product of two measures: openness-by-parents' education, openness-by-family decision style and openness-by-family rules. The first variable was to check whether open schools have a greater impact on the learning of advantaged or disadvantaged students, and the other two interaction variables were to check whether open schools were more advantageous for students from more "open" family environments.

The statistical criterion used was whether the addition of the interaction variable created a significant gain in explained variation in the regression of eight other independent variables on student achievement test scores (Kerlinger and Pedhazur, 1973). None of the school-by-family interaction variables were found to be significant. Neither a student's home socio-economic status nor family authority structure appeared to have large influences on the size or direction of open school effects on achievement.

Although the size of the interaction effects did not pass tests of statistical significance, one of the interaction variables--openness-by-parents' education--did generate consistent subgroup differences across the grades and may merit further study in subsequent research.

Table 4 shows the pattern of school openness-by-parents' education. To construct this table, the sample in each grade is divided into two subgroups according to parents' education. In each subgroup, separate multiple regression analyses were conducted of achievement on school openness and the seven student input measures. A comparison between the subgroups of the regression slopes for school openness shows the same direction of differences in 14 of the 16 cases. For the students from the higher socio-economic group, there is a more positive relationship between school openness and achievement than for those students from the lower socio-economic group.

In grade 5, where the overall relationships are positive, the high SES students are more positive (for 4 of the 5 tests). In grade 7, where the overall relationships are usually non-significant, the higher

SES subgroup tends toward a positive association between school openness and achievement, while the lower SES subgroup tends toward a negative relationship. A similar pattern is seen in grade 12 with the one subtest available for this study. In grade 9, where the overall relationships are negative, the achievement of students from higher SES backgrounds is less negatively related to school openness than is the achievement of students from lower SES origins.[11/]

Summary

The most defensible general conclusion from these findings is that students neither lose nor gain significantly in their performance on standardized achievement tests as a consequence of attending open schools. The various pieces of evidence--small percent of variation in achievement due to school differences, inconsistent direction of effects across grades, no trend in effects due to length of exposure to openness, and no pattern of relationships between subject-specific measures of openness and achievement--strongly suggest that openness of instructional approach is of minor consequence for this academic outcome of the average student. The probable reason for finding small statistically significant differences for openness in some grades is the difficulty in survey research to adequately control for initial differences in achievement of students assigned to the various schools.

There are some hints here that positive achievement effects may be found in later studies of openness that concentrate on the elementary grades, where most growth in basic academic skills occurs, and possibly

that effects will be more noticeable for advantaged students. But, these suggestions are drawn from very weak evidence, and require further studies before they should be taken very seriously.

Finally, it is important to note that this paper has dealt only with academic achievement from test scores. Other results from this study, not reported here, indicate that the strongest potential effects of school openness on student development will be found for non-academic outcomes such as student self-reliance, sense of efficacy and positive reactions to school life.

FOOTNOTES

1. One exception to this generalization may be the variable of school "size" (See Barker and Gump, 1965).

2. Test scores and the measure of school openness are available for all enrolled students in grades 5, 7 and 9. Survey questionnaires which provide individual data for the other variables in the analyses were collected from 93 percent of students in grade 5, 93 percent in grade 7 and 92 percent in grade 9. Grade 12 is different in that a special testing involving a single subtest (Reading Comprehension) of the usual battery was administered, and not all enrolled students were obtained. In this grade, 73 percent of the enrolled students surveyed with the questionnaire and tests were available, and 74 percent were tested on the special test, with only 52 percent of those tests having questionnaire data available. Thus, the grade 12 results must be treated with particular caution.

3. In the elementary grades, "Language Arts" replaced English as one of the subjects.

4. This is the percent who checked "Always" or "Often" to the positive questions, or the percent who checked "Seldom" or "Never" to the negative questions. Questions 2, 3, 6 and 7 are scored in the positive direction, and 1, 4 and 5 are scored negatively.

5. Questions 1 and 2 load primarily on the first factor; 4 and 5 on the second; and 6 and 7 on the third.

6. The scoring used for the responses to each of these questions is:

   Did not go to high school = 8
   Some high school, but did not graduate = 10
   Graduated from high school = 12
   Technical or business school after high school = 13
   Some college, but less than 4 years = 14
   Graduated from a 4 year college = 16
   Attended graduate or professional school after college = 18

   This scoring represents the number of years of school completed for each category.

7. The check list included the following: telephone, two telephones, vacuum cleaner, stereo hi-fi record player, air conditioner, electric dishwasher, your own family washing machine, your own family clothes dryer, dictionary, encyclopedia, daily newspaper, three or more magazine subscriptions, black and white TV, color TV, car, second car, two bathrooms, tape recorder, home movie projector, home slide projector, typewriter, piano, skis or golf clubs.

   The reliability coefficient (KR-8) for this scale equals .79.

FOOTNOTES - Continued

8. The twelve items and their scoring are:

My parents are:

0 = very strict
0 = strict
0 = a little strict
1 = not at all strict

T = 0, F = 1 My parents want me to follow their directions even if I disagree with their reasons.

T = 0, F = 1 My parents often worry that I am up to something they won't like.

T = 1, F = 0 I do not have to ask my parents for permission to do most things.

T = 1, F = 0 My parents trust me to do what they expect without checking up on me.

T = 0, F = 1 My parents do not like me to disagree with them if their friends are around.

T = 0, F = 1 I often do not know why I am supposed to do what my parents tell me to do.

T = 0, F = 1 I often count on my parents to solve many of my problems for me.

T = 0, F = 1 I have a lot of loud arguments with my parents about their rules and decisions for me.

T = 0, F = 1 My parents treat me more like a little kid than like an adult.

How are most decisions about you usually made in your family?

0 = My parents tell me just what to do.
0 = My parents ask me how I feel and then they decide.
1 = My parents tell me how they feel and then I decide.
1 = My parents let me decide.

How much do you take part in making family decisions about yourself?

1 = Very much
1 = Much
0 = Some
0 = Very little
0 = None at all.

The reliability coefficient (KR-8) for this scale equals .71.

FOOTNOTES - Continued

9. The checklist includes:

time to be in at night on weekends
time to be in on school nights
time spent watching TV
time spent on homework
against going around with certain boys
against going around with certain girls
eating dinner with the family
use of telephone
clothes you may wear
how you wear your hair
going to church or temple
doing the dishes
doing other jobs around the house
coming straight home from school.

The reliability coefficient (KR-8) for this scale equals .75.

10. The procedures for partitioning explained variation into unique and joint components through multiple regression analyses are described in Mood (1971), Cohen (1968) and Kerlinger and Pedhazur (1973).

11. We are indebted to Denise C. Daiger for her assistance in computer tape development and data analysis for this report.

References

Barker, Roger G. and Paul V. Gump. Big School, Small School. High School Size and Student Behavior. Stanford, California: Standford University Press, 1964.

Berliner, David C. and Leonard S. Cahen. Trait-treatment interaction and learning. In Kerlinger, Fred N. (Ed.) Review of Research in Education. Itasca, Illinois: Peacock, 1973.

Cohen, Jacob. Multiple regression as a general data - analytic system. Psychological Bulletin, 70, 1968, 426-443.

Kerlinger, Fred N. and Elazar J. Pedhazur. Multiple Regression in Behavioral Research. New York: Holt, Rinehart and Winston, 1973, 297-305.

McPartland, James and Joyce L. Epstein. School Organization and Student Outcomes. A Study of the Effects of Open-Environment Schools. Baltimore: Johns Hopkins University - Center for Social Organization of Schools, Report No. 166, 1973.

Mood, A. M. Partitioning variance in multiple regression analyses as a tool for developing learning models. American Educational Research Journal, 8, 1971, 191-202.

Walberg, Herbert J. and Susan Christie Thomas. Open Education: An Operational Definition and Validation in Great Britain and United States. American Educational Research Journal, 9, 1972, 197-208.

TABLE 1

UNIQUE CONTRIBUTIONS OF OPENNESS OF SCHOOL PROGRAM TO PERCENT OF VARIANCE ACCOUNTED FOR IN ACHIEVEMENT TEST SCORES, BY GRADE AND TEST*

TEST	GRADE			
	5	7	9	12
Composite	0.44	(-) 0.01	(-) 0.29	--
Language Total	0.09	0.00	(-) 0.45	--
Work-Study Skills	0.46	(-) 0.06	(-) 0.65	--
Mathematics Total	0.80	(-) 0.29	(-) 1.67	--
Reading Comprehension	0.49	0.04	(-) 0.11	0.43
Sample Size	1896	1733	1629	927

* (-) preceding the number indicates that the partial relationship of school openness to achievement is negative.

TABLE 2

PARTITIONING OF PERCENT OF VARIANCE ACCOUNTED FOR IN COMPOSITE TEST SCORES BY SCHOOL OPENNESS (SCH), FAMILY AUTHORITY STRUCTURE (FAM), AND FIVE STUDENT BACKGROUND MEASURES (BACK): GRADES 5, 7, 9 AND 12

SOURCE OF VARIANCE ACCOUNTED FOR	GRADE			
	5	7	9	12*
Unique - SCH	0.44	0.01	0.29	0.43
Unique - FAM	5.34	0.47	1.69	2.48
Unique - BACK	18.12	25.32	26.89	16.12
Joint - SCH + FAM	0.39	-0.00	-0.08	0.06
Joint - SCH + BACK	0.25	0.59	0.04	1.58
Joint - FAM + BACK	4.46	0.80	0.58	-0.17
Joint - SCH + FAM + BACK	0.43	0.11	0.28	0.21
TOTAL VARIANCE ACCOUNTED FOR	29.43	27.30	29.70	20.70

*In grade 12, the Reading Comprehension Test score is used rather than composite score.

TABLE 3

RELATIONSHIP BETWEEN OPENNESS OF INSTRUCTION IN THREE SUBJECTS AND STUDENT ACHIEVEMENT ON THREE TESTS, GRADES 5, 7 AND 9

(b = standardized regression coefficient from equation with seven background and family variables included as controls; t = test statistic)

Grade	Subject Specific Openness	Language b	Language t	Mathematics b	Mathematics t	Work-Study Skills b	Work-Study Skills t
5	Open. English	.04	(1.7)	.01	(0.6)	-.00	(-0.2)
5	Open. Math	.03	(1.5)	.04	(1.7)	.04	(1.8)
5	Open. Soc. Studies	.08	(3.8)	.13	(6.1)	.07	(3.4)
7	Open. English	-.01	(-0.7)	-.06	(-2.6)	-.01	(-0.4)
7	Open. Math	.04	(1.7)	.00	(0.6)	.01	(0.6)
7	Open. Soc. Studies	.00	(0.1)	-.03	(-1.4)	-.01	(-0.6)
9	Open. English	-.07	(-3.0)	-.10	(-4.2)	-.06	(-2.7)
9	Open. Math	-.05	(-2.1)	-.12	(-5.0)	-.06	(-2.7)
9	Open. Soc. Studies	-.09	(-3.8)	-.10	(-4.4)	-.09	(-4.0)

TABLE 4

RELATIONSHIP BETWEEN OPENNESS OF SCHOOL AND ACHIEVEMENT TEST SCORES FOR STUDENT SUBGROUPS BY SOCIO-ECONOMIC STATUS (SES)
(b = Unstandardized regression slope, t = Test Statistic[1/])

Grade and Subgroups	TEST										Sample Size
	Composite		Language		Work-study		Math		Reading Comprehension		
	b	t	b	t	b	t	b	t	b	t	
5 TOTAL	.12	(3.4)	.05	(1.6)	.13	(3.4)	.17	(4.5)	.13	(3.5)	1896
LOW SES	.12	(1.7)	.04	(0.5)	.16	(2.3)	.15	(2.0)	.10	(1.4)	694
HIGH SES	.16	(3.2)	.10	(2.0)	.14	(2.6)	.22	(4.1)	.16	(3.2)	683
7 TOTAL	-.01	(-0.4)	.01	(0.2)	-.04	(-1.1)	-.09	(-2.5)	.03	(1.0)	1733
LOW SES	-.05	(-0.8)	-.03	(-0.4)	-.07	(-0.9)	-.15	(-2.0)	.01	(0.2)	572
HIGH SES	.06	(1.2)	.08	(1.6)	.03	(0.6)	-.02	(-0.5)	.08	(1.6)	771
9 TOTAL	-.05	(-2.6)	-.06	(-3.2)	-.07	(-3.8)	-.12	(-6.0)	-.03	(-1.5)	1629
LOW SES	-.08	(-2.4)	-.10	(-2.8)	-.10	(-2.8)	-.14	(-3.7)	-.01	(-0.2)	639
HIGH SES	-.03	(-1.1)	-.02	(-0.8)	-.03	(-1.2)	-.08	(-2.9)	-.02	(-0.8)	611
12 TOTAL	---		---		---		---		.07	(2.2)	927
LOW SES	---		---		---		---		.01	(0.6)	373
HIGH SES	---		---		---		---		.04	(2.3)	266

[1/] t-statistic values of 1.96 or larger are statistically significant beyond the .05 level.